

## Process for the recovery of a Lewis acid

## Abstract

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A process for the recovery of a Lewis acid from a reaction mixture (I) which has been obtained in the hydrocyanation of an olefinically unsaturated compound to a nitrile which has a miscibility gap with water under certain amount, pressure and  
10 temperature conditions, in the presence of a catalyst system comprising a Lewis acid and a complex compound comprising a phosphorus-containing compound which is suitable as ligand and a central atom which is suitable for this compound,

15 which comprises

- a) removing the said complex compound from mixture (I) to give a mixture (II),
- 20 b) adding water to mixture (II) and placing the latter under pressure and temperature conditions such that a phase (III) which has a higher content of water than of the said nitrile and a phase (IV) which has a higher content of the said nitrile than of water are obtained, where phase (III) has a  
25 higher content of the said Lewis acid than does phase (IV),
- c) adding a liquid diluent (V) which
  - c1) does not form an azeotrope with water and whose boiling  
30 point under certain pressure conditions is higher than that of water or
  - c2) forms an azeotrope or heteroazeotrope with water under  
35 certain pressure conditions,
- to phase (III),
- d) subjecting the mixture of phase (III) and liquid diluent (V) to distillation under the pressure conditions mentioned in  
40 step c1) or c2), giving a mixture (VI) which has a higher content of water than of diluent (V) and a mixture (VII) which has a higher content of diluent (V) than of water, where mixture (VII) has a higher content of the said Lewis acid than does mixture (VI),  
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- e)   subjecting mixture (VII) to hydrocyanation of an olefinically unsaturated compound to give a nitrile which has a miscibility gap with water under certain amount, pressure and temperature conditions, in the presence of a catalyst system comprising a Lewis acid and a complex compound comprising a phosphorus-containing compound which is suitable as ligand and a central atom which is suitable for this compound.

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